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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Randy J. Pritzker
Wolf, Greenfield & Sacks, P.C.
600 Atlantic Avenue
Boston, MA 02210

EXAMINER	
MOWLA, GOLAM	

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02/18/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/822,556	ENOMOTO ET AL.	
	Examiner	Art Unit	
	GOLAM MOWLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/17/2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/17/2008 has been entered.

Response to Amendment

2. Applicant's amendment of 10/17/2008 does not place the Application in condition for allowance.

3. Claims 1-39 are pending. Applicant has amended claims 1, 9-14, 19, 22-26 and 29-31, and added new claims 32-36.

Status of the Objections or Rejections

4. Due to Applicant's amendment of claims 1, 9-14, 19, 22-26 and 29-31, all rejections from the office Action mailed on 09/02/2008 are withdrawn. However, upon further consideration, a new ground of rejection is presented below.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "metal oxide" in line 2. There is insufficient antecedent basis for this limitation in the claim. Applicant is suggested to identify it as the first or second metal oxide film.

Claim 18 recites the limitation "the metal oxide" in line 2. There is insufficient antecedent basis for this limitation in the claim. Applicant is suggested to identify it as the first or second metal oxide film.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura. (US 6291763) in view of Meinhardt et al. ("Optoelectronic Device made from Multilayer and Molecularly Doped Organic Layers," 01/1999). Supporting evidence is provided by the chemical structure provided by “Laboratory for Surface Physics and Chemistry” (accessed from http://www.ifm.liu.se/surfphys/pedot-pss.html on 08/21/2008).

Regarding claims 1 and 2, Nakamura teaches a fabrication method of a photoelectric conversion device (fig. 2A; col. 29, lines 42-48) comprising a semiconductor electrode (dye sensitized semiconductor layer 14 containing semiconductor particles; col. 4, lines 19-67) and a metal film (porous electron

conducting layer 11 which is made of metal; col. 14, line 66 through col. 15, line 7) to be an opposite electrode formed on a metal oxide film (top transparent conductor layer 12 which is formed of ITO; col. 5, lines 61-63).

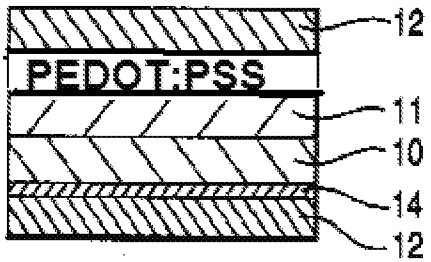
However, the reference is silent as to whether the method includes steps of forming an intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 1 or 3 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 2 or 4, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the metal oxide film, the metal oxide film directly contacting the intermediate film, and forming the metal film on the intermediate film, the metal film directly contacting the intermediate film:

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the metal oxide film (top 12) of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 3 and formula 4 (see chemical structure of PEDOT/PSS provided by “Laboratory for Surface Physics and Chemistry”, and also fig. 1 of Meinhardt et al on page 47).

Nakamura as modified by Meinhardt has the following modified figure:

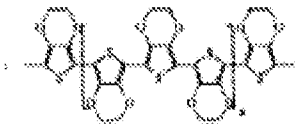


---------- (fig. 1)

The above illustrated fig. 1 further shows that the intermediate layer (PEDOT:PSS layer) is formed on the metal oxide film (top 12), the metal oxide film (12) directly contacting the intermediate film (see fig. above), and forming the metal film (11) on the intermediate film (PEDOT:PSS layer of Meinhardt), the metal film (11) directly contacting the intermediate film (PEDOT:PSS layer; see above fig.1).

Regarding claim 3, Nakamura as modified by Meinhardt further teaches that the intermediate film (PEDOT:PSS layer of Meinhardt) is formed by using an aqueous solution containing polyethylene dioxythiophene defined by the following Formula 5, polystyrenesulfonic acid ion defined by the following Formula 6, and polystyrenesulfonic acid defined by the following Formula 7. PEDOT doped with PSS is commercially available in an aqueous suspension as evidence given by Meinhardt, chemical structure of PEDOT/PSS provided by “Laboratory for Surface Physics and Chemistry”, and Starck GmbH (http://server2.idtechex.com/products/en/presentation.asp?presentationid=646

accessed 1/31/2008) defined by the following Formula 1, polystyrenesulfonic acid ion defined by the following Formula 2, and polystyrenesulfonic acid defined by the following also Formula 3 as shown in Figure 1 of,



Formula 1

Formula 2

Formula 3

Regarding claim 4, Nakamura further discloses that the metal oxide film (top 12) is made of In-Sn oxide (col. 5, lines 63-65).

Regarding claim 5, Nakamura further discloses that the metal film (11) is made of at least one metal selected from platinum, gold, aluminum, copper, and silver (col. 15, lines 5-7).

Regarding claim 6, Nakamura further discloses that the metal film (11) is a monolayer film (see fig. 2A) made of at least one metal selected from platinum, gold, aluminum, copper, and silver (col. 15, lines 5-7).

Regarding claim 7, Nakamura further discloses that the semiconductor electrode (14) is composed of semiconductor fine particles, the semiconductor fine particles having an average particle diameter of primary particles ranging between approximate 1 nm to approximately 200 nm (col. 5, lines 5-13).

Regarding claim 8, Nakamura further discloses that the photoelectric conversion device is a wet type solar cell (use of electrolytic solution; col. 25, lines 23-39).

Regarding claim 9, Nakamura teaches a photoelectric conversion device (fig. 2A; col. 29, lines 42-48) comprising a semiconductor electrode (dye sensitized

semiconductor layer 14 containing semiconductor particles; col. 4, lines 19-67) and a metal film (porous electron conducting layer 11 which is made of metal; col. 14, line 66 through col. 15, line 7) to be an opposite electrode formed on a metal oxide film (top transparent conductor layer 12 which is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to an intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 8 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 9, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the metal oxide film, the metal oxide film directly contacting the intermediate film, and forming the metal film on the intermediate film, the metal film directly contacting the intermediate film.

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the metal oxide film (top 12) of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 8 and formula 9 (see chemical structure of PEDOT/PSS provided by "Laboratory for Surface Physics and Chemistry", and also fig. 1 of Meinhardt et al. on page 47).

Nakamura as modified by Meinhardt further shows that the intermediate layer (PEDOT:PSS layer) is formed on the metal oxide film (top 12), the metal oxide film (12) directly contacting the intermediate film (see fig. above), and forming the metal film (11) on the intermediate film (PEDOT:PSS layer of Meinhardt), the metal film (11) directly contacting the intermediate film (PEDOT:PSS layer; see above fig.1).

Regarding claim 10, Nakamura teaches a manufacturing method of an electronic apparatus (a photoelectric conversion device as shown in fig. 2A; col. 29, lines 42-48) comprising a metal film (porous electron conducting layer 11 which is made of metal; col. 14, line 66 through col. 15, line 7) formed on a metal oxide film (top transparent conductor layer 12 which is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to whether the method includes steps of forming an intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 10 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 11, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the metal oxide film, the metal oxide film directly contacting the intermediate film, and forming the metal film on the intermediate film, the metal film directly contacting the intermediate film.

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the metal oxide film (top 12) of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 10 and formula 11 (see chemical structure of PEDOT/PSS provided by "Laboratory for Surface Physics and Chemistry", and also fig. 1 of Meinhardt et al on page 47).

Nakamura as modified by Meinhardt further shows that the intermediate layer (PEDOT:PSS layer) is formed on the metal oxide film (top 12), the metal oxide film (top 12) directly contacting the intermediate film (see fig. above), and forming the metal film (11) on the intermediate film (PEDOT:PSS layer of Meinhardt), the metal film (11) directly contacting the intermediate film (PEDOT:PSS layer; see above fig.1).

Regarding claim 11, Nakamura teaches an electronic apparatus (a photoelectric conversion device as shown in fig. 2A; col. 29, lines 42-48) comprising a metal film (porous electron conducting layer 11 which is made of metal; col. 14, line 66 through

col. 15, line 7) formed on a metal oxide film (top transparent conductor layer 12 which is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to an intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 12 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 13, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the metal oxide film and forming the metal film on the intermediate film, the metal film directly contacting the intermediate film:

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the metal oxide film (top 12) of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 12 and formula 13 (see chemical structure of PEDOT/PSS provided by “Laboratory for Surface Physics and Chemistry”, and also fig. 1 of Meinhardt et al on page 47).

Nakamura as modified by Meinhardt further shows that the intermediate layer (PEDOT:PSS layer) is formed on the metal oxide film (top 12), the metal oxide film (12) directly contacting the intermediate film (see fig. above), and forming the metal film (11) on the intermediate film (PEDOT:PSS layer of Meinhardt), the metal film (11) directly contacting the intermediate film (PEDOT:PSS layer; see above fig.1).

Regarding claim 12, Nakamura teaches a metal film formation method (fig. 2A; col. 29, lines 42-48) for forming a metal film (porous electron conducting layer 11 which is made of metal; col. 14, line 66 through col. 15, line 7) on a metal oxide film (top transparent conductor layer 12 which is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to whether the method includes steps of forming an intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 14 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 15, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the metal oxide film and forming the metal film on the intermediate film, the metal film directly contacting the intermediate film.

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the metal oxide film (top 12) of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 14 and formula 15 (see chemical structure of PEDOT/PSS provided by "Laboratory for Surface Physics and Chemistry", and also fig. 1 of Meinhardt et al on page 47).

Nakamura as modified by Meinhardt further shows that the intermediate layer (PEDOT:PSS layer) is formed on the metal oxide film (top 12), the metal oxide film (12) directly contacting the intermediate film (see fig. above), and forming the metal film (11) on the intermediate film (PEDOT:PSS layer of Meinhardt), the metal film (11) directly contacting the intermediate film (PEDOT:PSS layer; see above fig.1).

Regarding claim 13, Nakamura teaches a photoelectric conversion device (fig. 2A; col. 29, lines 42-48) comprising a layer structure, which comprises a metal film (porous electron conducting layer 11 which is made of metal; col. 14, line 66 through col. 15, line 7) on a metal oxide film (top transparent conductor layer 12 which is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to an intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 16 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 17, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an

alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the metal oxide film and forming the metal film on the intermediate film, the metal film directly contacting the intermediate film.

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the metal oxide film (top 12) of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 16 and formula 17 (see chemical structure of PEDOT/PSS provided by "Laboratory for Surface Physics and Chemistry", and also fig. 1 of Meinhardt et al on page 47).

Nakamura as modified by Meinhardt further shows that the intermediate layer (PEDOT:PSS layer) is formed on the metal oxide film (top 12), the metal oxide film (12) directly contacting the intermediate film (see fig. above), and forming the metal film (11) on the intermediate film (PEDOT:PSS layer of Meinhardt), the metal film (11) directly contacting the intermediate film (PEDOT:PSS layer; see above fig.1).

Regarding claims 14-15, 23 and 25, Nakamura teaches a fabrication method of a photoelectric conversion device or an electronic apparatus (fig. 2A; col. 29, lines 42-48)

comprising a semiconductor electrode (dye sensitized semiconductor layer 14 containing semiconductor particles; col. 4, lines 19-67) composed of semiconductor fine particles (col. 5, lines 5-13) on a first metal oxide film (bottom transparent conductor layer 12), the semiconductor fine particles having an average particle diameter of primary particles ranging between approximate 1 nm to approximately 200 nm (col. 5, lines 5-13); and forming an opposite electrode (top transparent conductor 12) associated with the semiconductor electrode (14), the opposite electrode (top 12) having a second oxide film (12 is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to whether the method includes steps of forming a first intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 18/20/27/31 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 19/21/28/32, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the first metal oxide film and forming the semiconductor electrode on the first intermediate film, the semiconductor electrode directly contacting the first intermediate film. The reference is also silent as to whether the opposite electrode (12) further comprises a second intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 18 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 19, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the second metal oxide film, the second

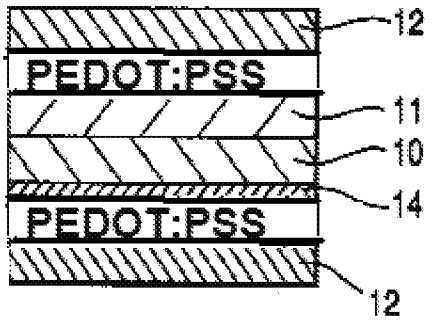
intermediate film directly contacting the second metal oxide film, and the second intermediate film directly contacting a metal film.

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the first (bottom 12) and second (top 12) metal oxide films of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 18/20/27/31 and formula 19/21/28/32 (see chemical structure of PEDOT/PSS provided by "Laboratory for Surface Physics and Chemistry", and also fig. 1 of Meinhardt et al. on page 47).

Nakamura as modified by Meinhardt has the following modified figure:

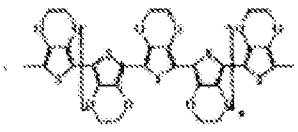


---------- (fig. 2)

The above illustrated fig. 2 further shows that the first intermediate layer (bottom PEDOT:PSS layer) is formed on the first metal oxide film (10) and forming the semiconductor electrode (14) on the first intermediate film (bottom PEDOT:PSS layer of Meinhardt), the semiconductor electrode (14) directly contacting the first intermediate film (bottom PEDOT:PSS layer; see above fig. 2); and the opposite electrode (top 12 doped with PEDOT:PSS) having a second intermediate film (top PEDOT:PSS layer) satisfying formulae 18 and 19, the second intermediate film (top PEDOT:PSS layer) formed on the second metal oxide film (top 12), the second intermediate film (top PEDOT:PSS layer) directly contacting the second metal oxide (top 12), and the second intermediate film (top PEDOT:PSS layer) directly contacting a metal film (layer 11 which is made of metal) (col. 15, lines 5-13).

Regarding claim 16, Nakamura as modified by Meinhardt further teaches that the intermediate film is formed by using an aqueous solution containing polyethylene dioxythiophene defined by the following Formula 22, polystyrenesulfonic acid ion defined by the following Formula 23, and polystyrenesulfonic acid defined by the following Formula 23. PEDOT doped with PSS is commercially available in an aqueous suspension as evidence given by Meinhardt, chemical structure of PEDOT/PSS

provided by “Laboratory for Surface Physics and Chemistry”, and Starck GmbH (http://server2.idtechex.com/products/en/presentation.asp?presentationid=646 accessed 1/31/2008) defined by the following Formula 1, polystyrenesulfonic acid ion defined by the following Formula 2, and polystyrenesulfonic acid defined by the following also Formula 3 as shown in Figure 1 of ,



Formula 1

Formula 2

Formula 3

Regarding claim 17, Nakamura further discloses that the metal oxide film (12) is made of In-Sn oxide (col. 5, lines 61-63).

Regarding claim 18, Nakamura further discloses the metal oxide film (12) is formed on a transparent plastic substrate (col. 6, lines 3-21).

Regarding claim 19, Nakamura further discloses the semiconductor electrode (14) is formed by using a strongly acidic semiconductor fine particle dispersion (col. 8, lines 7-29]).

Regarding claim 20, Nakamura further discloses that the semiconductor electrode (11) is formed at a temperature in the range of 100^{O}C to 600^{O}C (col. 7, lines 42-57). The claimed temperature range of 100^{O}C to 140^{O}C overlap with the disclosed temperature range, and in the case where the claimed ranges "overlap of lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (MPEP § 2144.05, In re Wertheim).

Regarding claim 21, Nakamura further discloses that the photoelectric conversion device is a wet type solar cell (use of electrolytic solution; col. 25, lines 23-39).

Regarding claims 22, 24 and 26, Nakamura teaches a photoelectric conversion device or an electronic apparatus (fig. 2A; col. 29, lines 42-48) comprising a semiconductor electrode (dye sensitized semiconductor layer 14 containing semiconductor particles; col. 4, lines 19-67) composed of semiconductor fine particles (col. 5, lines 5-13) on a first metal oxide film (bottom transparent conductor layer 12), the semiconductor fine particles having an average particle diameter of primary particles ranging between approximate 1 nm to approximately 200 nm (col. 5, lines 5-13); and forming an opposite electrode (top transparent conductor 12) associated with the semiconductor electrode (14), the opposite electrode (top 12) having a second oxide film (12 is formed of ITO; col. 5, lines 61-63).

However, the reference is silent as to whether the method includes steps of forming a first intermediate film comprising at least one compound selected from polythiophene defined by the following Formula 25/29/33 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 26/30/34, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the first metal oxide film and forming the semiconductor electrode on the first intermediate film, the semiconductor electrode directly contacting the first intermediate film. The reference is also silent as to whether the opposite electrode (12) further comprises a second intermediate film comprising at least one

compound selected from polythiophene defined by the following Formula 18 and its derivatives as well as polystyrenesulfonic acid defined by the following Formula 19, RSO_3H (R=an alkyl, an aryl or an alkoxy), $R'OSO_3H$ (R' = H, an alkyl, an aryl or an alkoxy), HCl, $HClO_4$, HPF_6, HBF_4, and HI_5 on the second metal oxide film, the second intermediate film directly contacting the second metal oxide film, and the second intermediate film directly contacting a metal film.

Meinhardt teaches the method of making an optoelectronic device (see title and abstract) wherein the In-Sn oxide film (ITO-electrode; see fig. 2 on page 48) is coated with PEDOT doped with PSS (See 2nd paragraph on page 48) to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability (See 2nd paragraph on page 48).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have coated the first (bottom 12) and second (top 12) metal oxide films of Nakamura which is also made of In-Sn oxide (col. 5, lines 61-63) with the conducting polymer PEDOT:PSS of Meinhardt to allow for high transmission in the visible spectral region, low sheet-resistance, good thermal stability and UV-stability, as shown by Meinhardt.

PEDOT doped with PSS has the structure of instant claimed formula 25/29/33 and formula 26/30/34 (see chemical structure of PEDOT/PSS provided by “Laboratory for Surface Physics and Chemistry”, and also fig. 1 of Meinhardt et al on page 47).

Nakamura as modified by Meinhardt further shows that the first intermediate layer (bottom PEDOT:PSS layer) is formed on the first metal oxide film (10) and forming

the semiconductor electrode (14) on the first intermediate film (bottom PEDOT:PSS layer of Meinhardt), the semiconductor electrode (14) directly contacting the first intermediate film (bottom PEDOT:PSS layer; see above fig. 2); and the opposite electrode (top 12 doped with PEDOT:PSS) having a second intermediate film (top PEDOT:PSS layer) satisfying formulae 18 and 19, the second intermediate film (top PEDOT:PSS layer) formed on the second metal oxide film (top 12), the second intermediate film (top PEDOT:PSS layer) directly contacting the second metal oxide (top 12), and the second intermediate film (top PEDOT:PSS layer) directly contacting a metal film (layer 11 which is made of metal) (col. 15, lines 5-13).

Regarding claims 27, 29 and 31, Nakamura further discloses injecting an electrolytic layer (electrolytic solution; col. 25, lines 22-39) between the metal film (11) and a semiconductor fine particle layer (14) (fig. 2A) (see also fig. 1 which shows the use of electrolyte layer 5 between the semiconductor layer 2 and metal film 6).

Regarding claims 28 and 30, Nakamura further discloses injecting an electrolytic layer (electrolytic solution; col. 25, lines 22-39) between the metal film (11) and a semiconductor fine particle layer (14) (fig. 2A) (see also fig. 1 which shows the use of electrolyte layer 5 between the semiconductor layer 2 and metal film 6).

Regarding claims 32-36, the reference is silent as to whether the layers are formed separately. However, selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). See also MPEP §2144.04 IVC.

Response to Arguments

9. Applicant's arguments with respect to claims 1, 9-14, 19, 22-26 and 29-31 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendments.

Applicant argues that “independent claims 1 and 9-13 have been amended to recite the metal oxide film directly contacting the intermediate film. In this respect, neither Nakamura, Roman, nor Meinhardt teach or suggest an intermediate film directly contacting both a metal film and a metal oxide film” (see Remarks, page 2).

This argument is directed to the claims as amended and is moot in view of new ground of rejection.

Applicant also argues that "independent claims 14 and 22-24 have been amended to recite forming an forming an opposite electrode associated with the semiconductor electrode, the opposite electrode having a second intermediate film on a second metal oxide film, the second intermediate film directly contacting the second metal oxide film and the second intermediate film directly contacting a metal film. In addition, independent claims 25-26 have been amended to recite forming an electrode associated with the semiconductor fine particle layer, the electrode having a second intermediate fdm on a second metal oxide film, the second intermediate film directly contacting the second metal oxide film and the second intermediate film directly contacting a metal film. Neither Nakamura, Roman, nor Meinhardt teach or suggest another electrode where a second intermediate film directly contacts both a second metal oxide film and a metal film” (Remarks, page 2).

These arguments are directed to the claims as amended and are moot in view of new ground of rejection.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-F, 0900-1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/G. M./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795